

Example 3 - Summary

Small Isolated Conveyance Facility

Emphasis

Isolate transport of a portion of export flows while improving levees to protect in-Delta uses and providing habitat improvements and additional storage for environmental and water supply benefits.

Distinguishing Features

This alternative provides a **medium** level of improvement and conflict resolution

Physical/Structural	Operational/Management	Institutional/Policy
<ul style="list-style-type: none"> Restoration of upstream and Delta habitats to increase fish populations New screens to protect fish from entrainment Relocated diversion point for up to 7,000 cfs of Delta exports to reduce fish entrainment Isolated water conveyance facility to increase export water quality and reliability Water storage facilities upstream, in-Delta, and south of Delta to increase flexibility of water supplies for all beneficial uses Moderate level of levee improvements to protect in-Delta uses 	<ul style="list-style-type: none"> Approximately 100,000 AF of San Joaquin River water purchased from willing sellers to improve fish transport through the Delta and Delta water quality Pollutant source controls to reduce discharges of salts and pesticide residues to San Joaquin River and Delta aquatic habitats 	<ul style="list-style-type: none"> Funded levee improvements, emergency levee management plan, and levee buffer zones to reduce system vulnerability Institutional improvements to facilitate water transfers, groundwater management and conjunctive use, and water conservation and reclamation to increase water supply reliability

Benefits

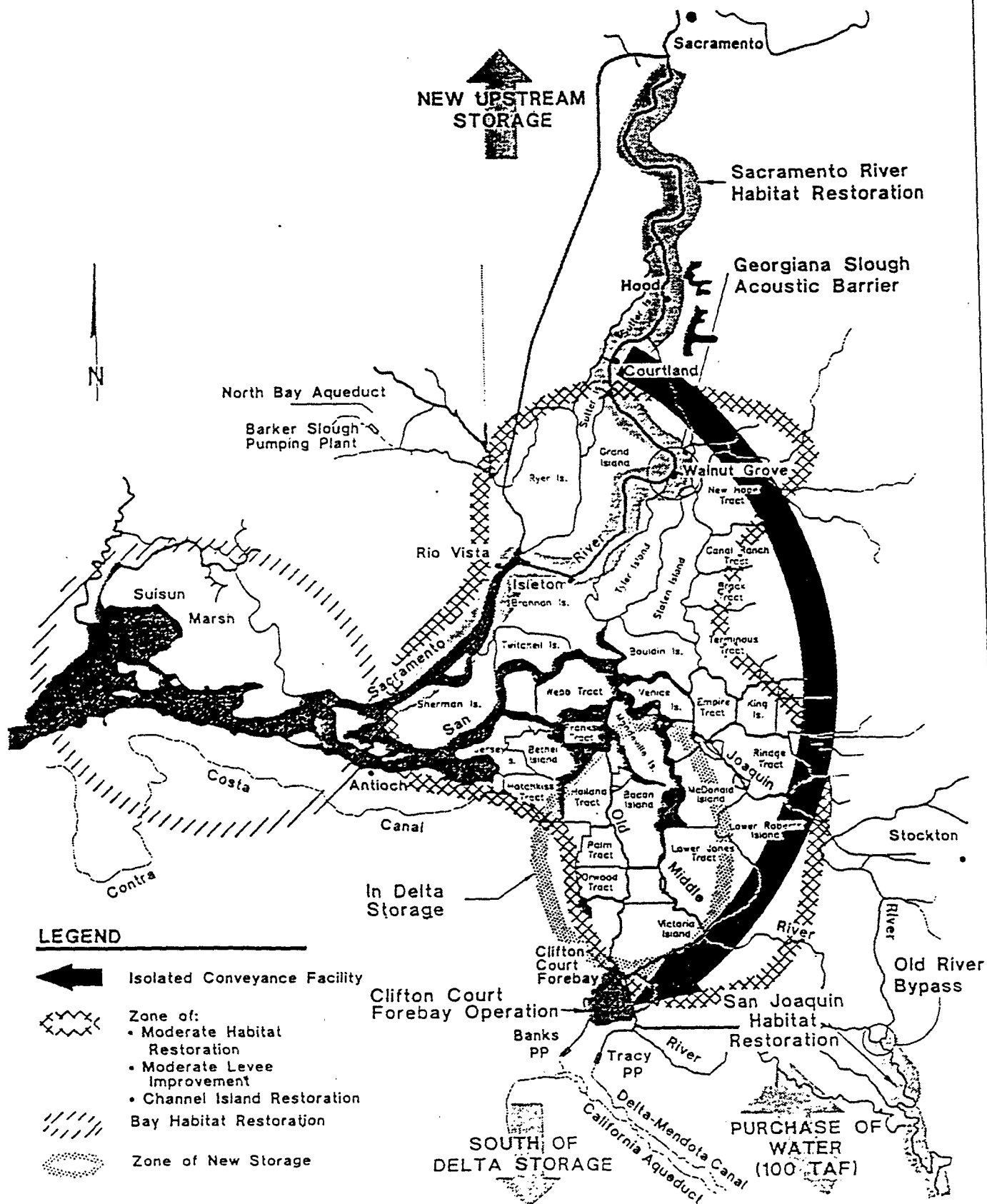
- Improves and increases aquatic and wetland habitats to support sustainable populations of high-interest species
- Improves Delta water quality through source controls and purchased water and improves export water quality by relocating diversion
- Reduces system vulnerability to catastrophic and long-term disruption of functions and beneficial uses
- Improves supply reliability by increasing system-wide storage capacities and relocating some Delta diversions; increases ability to store water during very high-flow periods for use during critically dry years and seasonally dry periods

Constraints and Concerns

- Construction of new conveyance and storage locations will cause site-specific environmental impacts
- Best available screening technology and real-time monitoring may not adequately avoid entrainment effects

Small Isolated Conveyance Facility

Example 3



Example 3 - Description

Small Isolated Conveyance Facility

Overview

This alternative will implement a comprehensive combination of habitat restoration, system reliability improvements, and water supply augmentation actions to achieve moderate levels of improvement for all program objectives. Delta and upstream habitats will be restored and fish screens will be installed on high priority diversions to improve fish production and survival. The point of diversion for a portion of Delta exports will be relocated upstream of the Delta on the Sacramento River and equipped with the best available fish screen technology to reduce entrainment of anadromous out migrants and Delta native fish. Water storage facilities will be constructed upstream of the Delta, in the Delta, and south of the Delta to increase capacities to capture, store, and efficiently use flows for environmental and water supply benefits.

The environmental restoration and water supply actions are combined with actions to improve levee stability and protect land uses and infrastructure in the Delta. Water quality improvements in the Delta are achieved through pollutant source control actions, while water quality for export use is improved by isolating a portion of the flows from the Delta.

Upstream of the Delta, restoration of anadromous fish habitats and screening of high priority diversions will increase fish populations. Increased upstream water storage can be used to provide pulse flows to transport fish through the Delta. Water of high quality will be diverted (up to 7,000 cfs) from the Sacramento River upstream of the Delta and transported through an isolated conveyance facility around the east side of the Delta to the export pumps. Fish screens will be installed to protect fish from entrainment and real-time monitoring will be used at the new and existing diversion locations to avoid entrainment effects when vulnerable fish are present.

In the Delta, levees will be improved to protect critical western islands and islands with important local and regional infrastructure or important habitat. Water storage will be constructed on Delta islands (300–400,000 AF) to provide greater capacities to manage water transfers, capture unregulated flows, minimize storage constraints on exports, and provide critical period supply in ways that avoid adverse effects on fish. Restoration of shallow-water tidal, riverine, and riparian habitat in combination with substantial levee improvements along about 75 to 125 levee miles will greatly increase foraging and rearing habitat for resident and anadromous fish. Restoration of shallow-water tidal wetlands from diked wetlands around Suisun Bay will increase habitat for young salmon, Delta smelt, splittail and other species. Approximately 100,000 AF of water will be purchased from San Joaquin River users to improve transport of fish through the Delta and improve south Delta water quality.

The combination of the new diversion point for a portion of Delta exports and the existing export facilities will allow diversion timing and volume to be managed to reduce entrainment and improve water quality. Additional water storage throughout the system will further maximize flexibility to meet Delta and export needs. Levee improvements will protect in-Delta uses and water quality actions will improve quality throughout the Delta.

Physical and Structural Features

Water Transport

Activities	Benefits
<ul style="list-style-type: none"> Construct a new, screened diversion point for a portion of export supplies on the Sacramento River upstream of the Delta 	<ul style="list-style-type: none"> Reduces entrainment of fish during export diversion
<ul style="list-style-type: none"> Construct a new conveyance facility to transport water from the new diversion point to existing pumping plants in the south Delta 	<ul style="list-style-type: none"> Improves water quality for export users Offers the capability to provide water supplies to users in the geographic region immediately east of the Delta Improves water supply reliability by adding flexibility of a second diversion point upstream of most Delta native fish habitat
Considerations	
<ul style="list-style-type: none"> Diversion and conveyance facility sized to transport up to 7,000 cfs for export. Diversion at a location upstream of the Delta such as near Hood or Freeport. Use best available screening technology and real-time monitoring to minimize fisheries impacts. Siphons will carry conveyance facility beneath existing Delta channels to avoid environmental, water quality, and flood conveyance impacts. 	

Habitat Restoration

Activities	Benefits
<ul style="list-style-type: none"> Restore riparian, shaded riverine, and shallow water habitat along Delta river channels 	<ul style="list-style-type: none"> Improves aquatic habitat
<ul style="list-style-type: none"> Restore Delta and floodway corridor shallow water, riparian, terrestrial, and tidal wetland habitat Restore approximately 75 to 125 miles of shallow water, riverine, and riparian habitat along Delta levees 	<ul style="list-style-type: none"> Provides spawning areas for Delta native fish as well as forage areas and escape cover for juvenile salmon, Delta smelt, splittail, and other species
<ul style="list-style-type: none"> Restore and protect channel islands from erosion and enhance habitat 	<ul style="list-style-type: none"> Provides habitat for aquatic and terrestrial plant and animal species
<ul style="list-style-type: none"> Restore about 1,500 to 2,500 acres of tidal wetlands in Suisun Bay 	<ul style="list-style-type: none"> Provides wet year spawning habitat for Delta smelt, rearing areas for salmon, and wildlife habitat (e.g. canvasback and redhead ducks)
<ul style="list-style-type: none"> Restore riverine channel features in the San Joaquin River to lower water temperature and to protect young fish from predation and straying 	<ul style="list-style-type: none"> Improves fish survival

Considerations

- **Delta River Habitat** – Implement habitat restoration between Sacramento and Collinsville.
- **Delta** – Candidate areas for shallow water habitat restoration include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta. Candidates for Delta levee habitat restoration include Twitchell Island along Three Mile Slough and Seven Mile Slough, Georgiana Slough, and the North and South Forks of the Mokelumne River.
- **Floodway Corridors** – Habitat restoration must not impair capacity of floodways.
- **Suisun Bay** – Convert diked wetlands or create tidal wetlands with dredge spoils between Collinsville and Carquinez Strait.
- **San Joaquin River** – Confine wide shallow channels and isolate quarry areas.

Water Storage

Activities	Benefits
<ul style="list-style-type: none"> • Convert one or more Delta islands to a water storage facility with approximately 300– 400,000 AF capacity • Construct screened diversions to divert flows into storage 	<ul style="list-style-type: none"> • Provides additional diversion flexibility • Improves fish transport through the Delta • Could significantly improve response time (compared to Folsom or Shasta Reservoirs) for releasing water for improved management of X2 • Reduces entrainment of fish • Reduces frequency and duration of export curtailments
<ul style="list-style-type: none"> • Construct new upstream storage with approximately 0.5 to 1 million AF capacity 	<ul style="list-style-type: none"> • Provides additional storage and operational flexibility for supply, quality, and the environment
<ul style="list-style-type: none"> • Construct new downstream storage with approximately 250 - 750,000 AF capacity 	<ul style="list-style-type: none"> • Provides additional storage and operational flexibility for supply, quality, and the environment
Considerations	
<ul style="list-style-type: none"> • Locate in-Delta reservoir near export pumps on one or more islands such as Bacon, Mandeville, or Victoria • Divert water during November, December, and January; release water from March to July as needed. With real-time monitoring, release water to move fish or release for diversion. • Creation of wide riparian and shallow water habitat corridor around perimeter of Delta island storage would provide additional benefits. 	

Fish Protection and Transport

Activities	Benefits
<ul style="list-style-type: none"> • Construct a San Joaquin River bypass at the head of Old River 	<ul style="list-style-type: none"> • Encourages out-migrating fish to stay in San Joaquin River • Allows for managing flows down Old River
<ul style="list-style-type: none"> • Install fish screens on moderate and high priority diversions in the Delta, rivers, and tributaries 	<ul style="list-style-type: none"> • Reduces entrainment of fish
<ul style="list-style-type: none"> • Construct screened State Water Project intake at Italian Slough 	<ul style="list-style-type: none"> • Avoids fish predation and entrainment in Clifton Court Forebay when diversion rates are low
<ul style="list-style-type: none"> • Improve drainage in floodway corridors 	<ul style="list-style-type: none"> • Reduces fish stranding
Considerations	
<ul style="list-style-type: none"> • Select diversions for screening according to criteria including size of intake, location, peril to fish, and screening feasibility. 	

Flood Protection and Levee Stabilization

Activities	Benefits
<ul style="list-style-type: none"> • Provide a moderate level of protection and stabilization of Delta levees as described below in "Considerations" 	<ul style="list-style-type: none"> • Reduces vulnerability of Delta land use and infrastructure • Reduces vulnerability of urban and agricultural export water supply • Reduces vulnerability of Delta ecosystem function
<ul style="list-style-type: none"> • Construct setback levees and stabilizing berms 	<ul style="list-style-type: none"> • Reduces vulnerability of levees to failure • Provides opportunities for habitat restoration
Considerations	
<ul style="list-style-type: none"> • Upgrade all Delta levees to meet at least the hazard mitigation plan standards. • Provide flood protection equivalent to Army Corps of Engineers PL 99 standard to critical western Delta islands (such as, Sherman Island, Jersey Island), islands with important regional infrastructure (such as Mokelumne Aqueduct, transmission lines, Highway 160, etc.), islands with important local infrastructure (such as New Hope Tract, Bouldin Island, Sherman Island, Palm Tract, Lower and Upper Jones Tracts, Lower Roberts Island), and islands with valuable habitat (such as Canal Ranch, Brack Tract, Staten Island, Venice Island, Rindge Tract, Big Mandeville Island, Webb Tract, Twitchell Island, and Bradford Island). • Integrate protection and stabilization of levees with Delta habitat restoration activities. • Provide stable funding mechanism for ongoing levee and habitat maintenance. 	

Operational and Management Features

Water Supply Management

Activities	Benefits
• Encourage groundwater banking programs	• Provides additional dry year water supply flexibility
• Expand water conservation best management practices (BMPs) and implement and expand efficient water management practices (EWMPs)	• Reduces demand for water from the Delta
• Implement feasible reclamation and reuse projects for urban and agricultural supplies.	• Reduces demand for water from the Delta
• Create a coordinated CALFED program to expedite and expand the use of water transfers to meet water needs during droughts	• Increases flexibility of water supplies during dry years
• Integrate land retirement and land fallowing programs with existing programs such as CVPIA and San Joaquin drainage program	• Reduces demand for water from the Delta • Improves water quality • Increases flexibility of water supplies during dry years
Considerations	
• Possible state and federal cosponsorship for conservation and reclamation programs. • Institutional needs to improve water transfers. • Land retirement and land fallowing will focus on marginal agricultural lands and lands from willing sellers.	

Water Diversion Management

Activities	Benefits
• Acquire about 100,000 AF of water from willing sellers in the San Joaquin basin	• Transports fish through San Joaquin River and Delta
• Use water for pulse flows for fish transport or diluting poor quality flows	• Improves water quality
• Coordinate with the operation of new south Delta storage to improve timing of diversions	• Improves management flexibility for diversions to reduce fish loss
• Improve real-time monitoring of locations of fish species of special concern and modify water diversions to avoid fish entrainment	• Provides an additional tool to help reduce entrainment of species of special concern • Improves flexibility to divert water during critical fish migration periods

<ul style="list-style-type: none"> • Evaluate, improve, and install behavioral barriers for anadromous fish 	<ul style="list-style-type: none"> • Diverts anadromous fish from areas of potential entrainment and predation • Allows for continued water diversions at current locations
Considerations	
<ul style="list-style-type: none"> • Evaluate continued use of an acoustic barrier at the mouth of Georgiana Slough • Evaluate barriers for Delta Cross Channel and Threemile Slough 	

Fisheries Management

Activities	Benefits
<ul style="list-style-type: none"> • Mark salmon produced in hatcheries 	<ul style="list-style-type: none"> • Facilitates selective catch of hatchery salmon by commercial and recreational fisheries
<ul style="list-style-type: none"> • Conduct net-pen rearing of striped bass to supplant natural production 	<ul style="list-style-type: none"> • Maintains recreational fishery • Reduces operational constraints on water diversions
Considerations	
<ul style="list-style-type: none"> • How to maintain recreational fisheries as well as enhance native salmon stocks. 	

Water Quality Management

Activities	Benefits
<ul style="list-style-type: none"> • Implement source control regulations for agricultural drainage 	<ul style="list-style-type: none"> • Improves Delta water quality
<ul style="list-style-type: none"> • Implement source control regulations for urban and industrial runoff 	<ul style="list-style-type: none"> • Improves Delta water quality
<ul style="list-style-type: none"> • Retain some San Joaquin Valley drainage and time discharges for maximum dilution during high river flows 	<ul style="list-style-type: none"> • Improves Delta water quality
<ul style="list-style-type: none"> • Implement land retirement actions for marginal agricultural lands with drainage problems 	<ul style="list-style-type: none"> • Improves Delta water quality
<ul style="list-style-type: none"> • Remediate discharges from abandoned mines in the Sacramento Valley downstream of Shasta Dam 	<ul style="list-style-type: none"> • Improves Delta water quality
Considerations	
<ul style="list-style-type: none"> • Determine extent and cost-effectiveness of water quality management actions. • Regulation of agricultural drainage may require new temporary storage ponds. 	

Institutional and Policy Features

Habitat Programs

Activities	Benefits
• Integrate recommended habitat restoration actions from other programs, including CVPIA and the Anadromous Fish Restoration Program	• Provides additional habitat restoration
• Establish programs to preserve agricultural land uses that provide valuable habitat functions	• Protects existing habitats
• Establish a coordinated CALFED regulatory team to expedite habitat restoration permits	• Accelerates acquiring permits for environmental restoration projects and other CALFED projects
• Establish and fund, management program, and rapid response team to manage introduced species	• Protects existing valuable species and habitat
• Establish a program to identify and use clean dredge materials from the Delta for habitat restoration and levee maintenance in the Delta	• Provides materials for habitat and levee improvements
• Encourage farmers and levee maintenance districts to leave habitat areas undisturbed through variances from regulations	• Protects existing habitats • Increases flexibility in maintenance programs
Considerations	
• Coordinate activities among these programs to avoid duplication.	

Management of System Vulnerability

Activities	Benefits
• Establish and fund an emergency levee management plan to respond to levee failures	• Provides resources to protect Delta functions
• Implement a subsidence management program to reverse decline in levels of Delta islands	• Provides a long-term increase in stability of Delta levees and reliability of Delta functions • Provides wetlands which benefit wildlife
Considerations	
<ul style="list-style-type: none"> Determine extent and cost-effectiveness of levee management programs. Successful program for reversal of subsidence would include converting agricultural use of appropriate deep Delta islands to wetlands. Management of less deeply subsided areas could include rotation of seasonal wetland with wildlife-friendly agricultural practices. 	

Water Management

Activities	Benefits
<ul style="list-style-type: none"> Establish a coordinated CALFED program to manage Delta flow operations 	<ul style="list-style-type: none"> Provides capability for rapid objective response to changing Delta conditions
<ul style="list-style-type: none"> Improve coordination of land use planning and water supply planning 	<ul style="list-style-type: none"> Provides improved understanding and reliability of future supplies
<ul style="list-style-type: none"> Develop long-term drought contingency plans 	<ul style="list-style-type: none"> Increases the reliability of supplies during dry years
<ul style="list-style-type: none"> Create a coordinated CALFED program to expedite and expand the use of water transfers to meet water needs during droughts 	<ul style="list-style-type: none"> Provides flexibility to transfer water for environmental or export purposes
Considerations	
<ul style="list-style-type: none"> Determine institutional needs to implement programs. 	

Water Quality Standards

Activities	Benefits
<ul style="list-style-type: none"> Maintain current standards for Delta water quality and position of X2 	<ul style="list-style-type: none"> Maintains Delta water quality
<ul style="list-style-type: none"> Reevaluate Delta export/inflow ratios during triennial review as habitat effectiveness is realized 	<ul style="list-style-type: none"> Facilitates higher level of water transfer as fishery populations improve
Considerations	
<ul style="list-style-type: none"> Continues X2 standards from 1995 Water Quality Control Plan. Monitor to verify effectiveness of habitat and entrainment-reduction programs. Develop an adaptive management program to modify habitat restoration and export/inflow ratios in response to improved sustainability of important species. 	

Preliminary Assessment

Benefits

Ecosystem Quality — This alternative improves and enhances habitat to support sustainability of high-interest species. Fish populations will substantially increase by restoration and improvement of critical habitat, by relocating a portion of south Delta export diversions, installation of fish screens and barriers, and by utilizing dedicated flows from new upstream storage and purchased flows to improve fish conveyance through the Delta.

Water Supply — This alternative improves water supply reliability by relocating a portion of the export diversions to an area where fish can be more easily protected from entrainment and by providing additional storage capacity upstream, in, and downstream of the Delta. Increased fish populations and increased flexibility of environmental water management options reduce the likelihood of regulatory interventions in export operations. Opportunities are created to provide supplies to geographic areas immediately east of the Delta.

Water Quality — Through source control regulations and discharge management, this alternative moderately improves Delta water quality. This alternative improves export water quality by isolating a portion of the flows from the Delta during all months of the year and allowing export of water from the south Delta to be curtailed when high salinities are present during low inflow periods.

System Vulnerability — This alternative reduces vulnerability of Delta functions to catastrophic and long-term loss. Critical western islands, important regional infrastructure, and valuable habitat all receive increased protection. Export water supplies are less vulnerable to salinity intrusion in the event of a failure of a Delta island.

Constraints and Concerns

There would be continued diversions of export supplies and the resulting entrainment in the south Delta, although at a reduced amount because there is more flexibility to adjust the timing of diversions to periods that are less disruptive to fish populations.

The best available screening technology and real-time monitoring may not be as effective as necessary in avoiding entrainment effects at a new diversion location.

Export water quality will only improve proportionally to the flexibility that is provided to manage south Delta exports during periods when high salinity waters are present.